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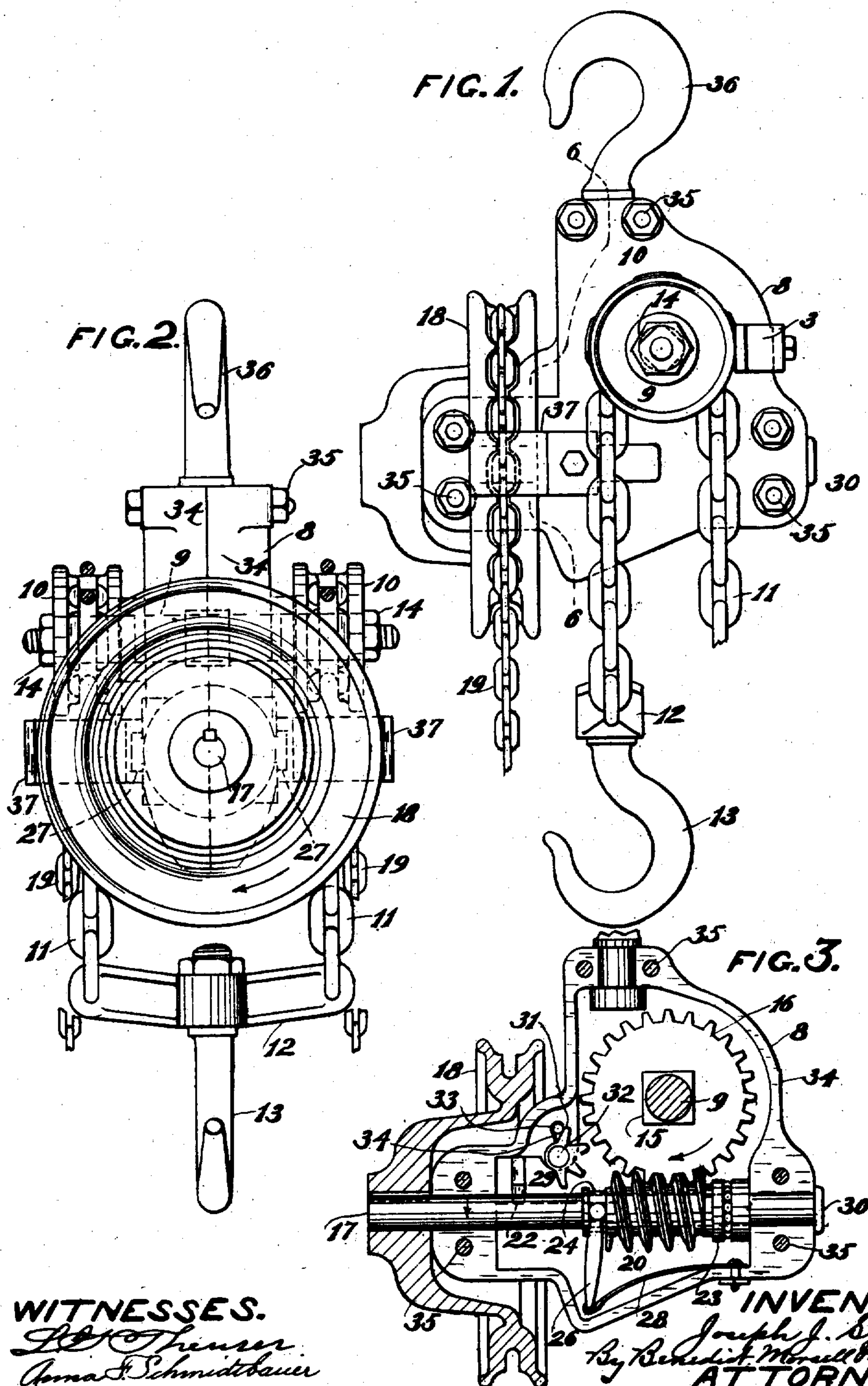
PATENTED SEPT. 1, 1908.

J. J. STOSICK.

CHAIN HOIST.

APPLICATION FILED JUNE 24, 1907.

2 SHEETS—SHEET 1.



WITNESSES.

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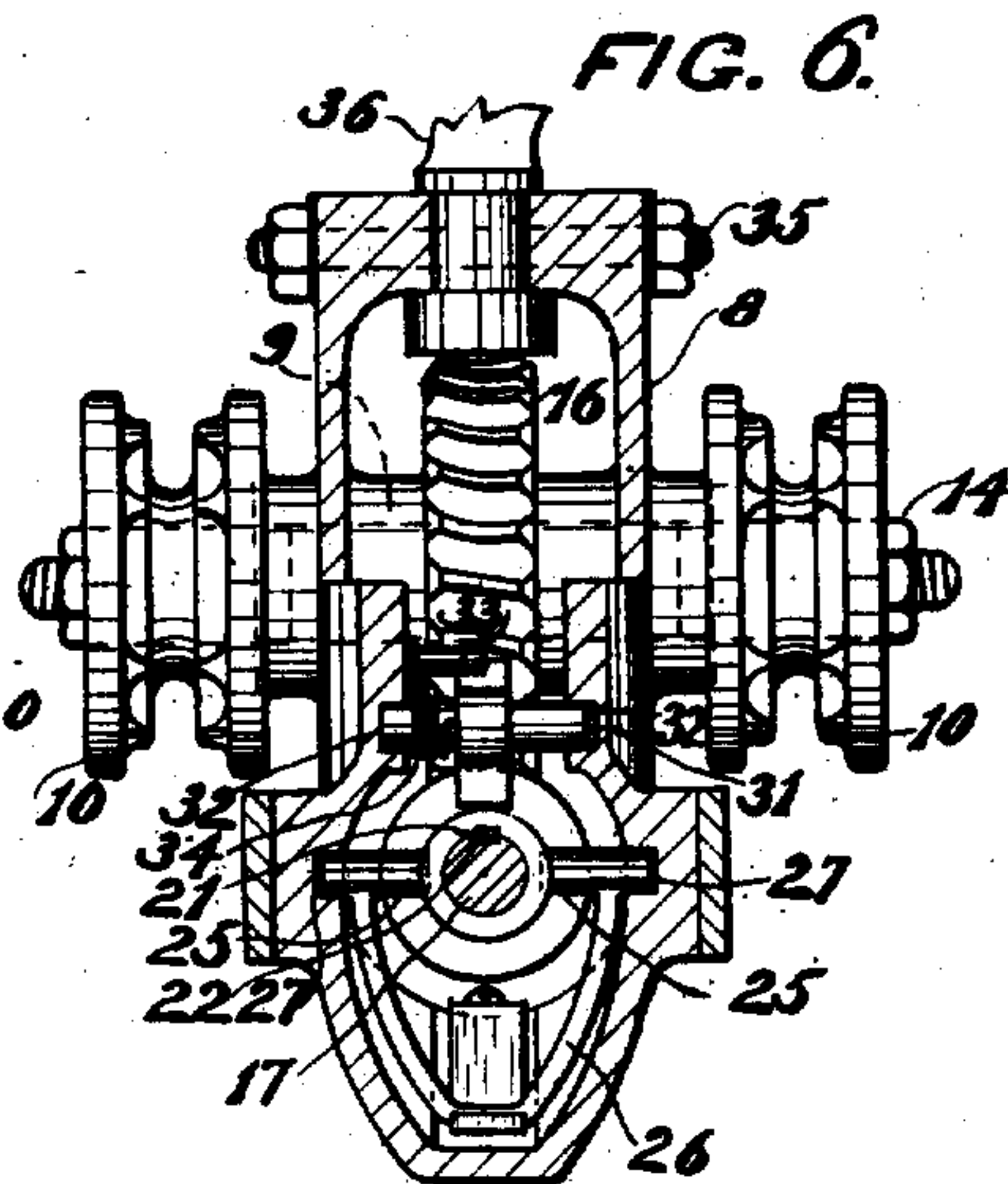
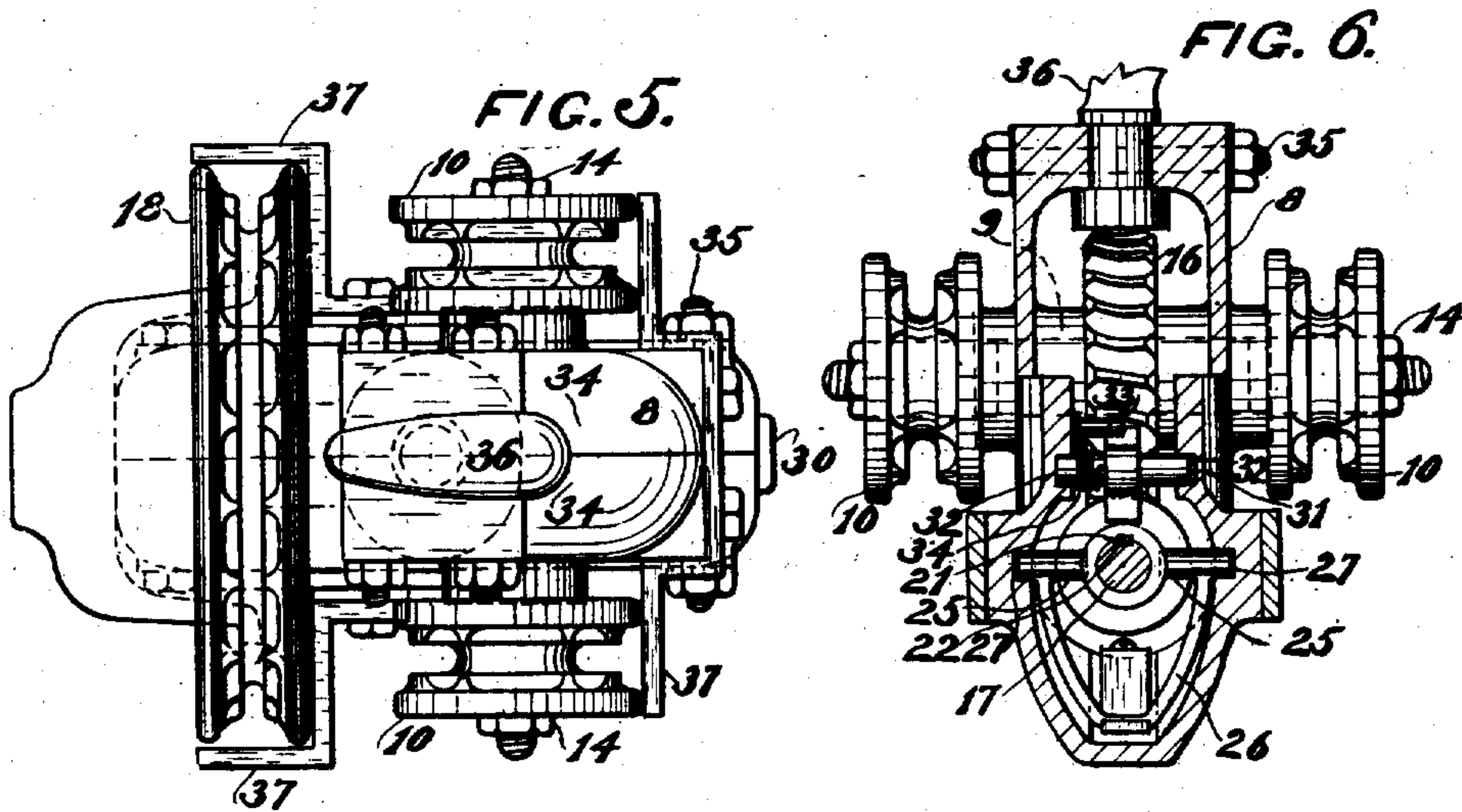
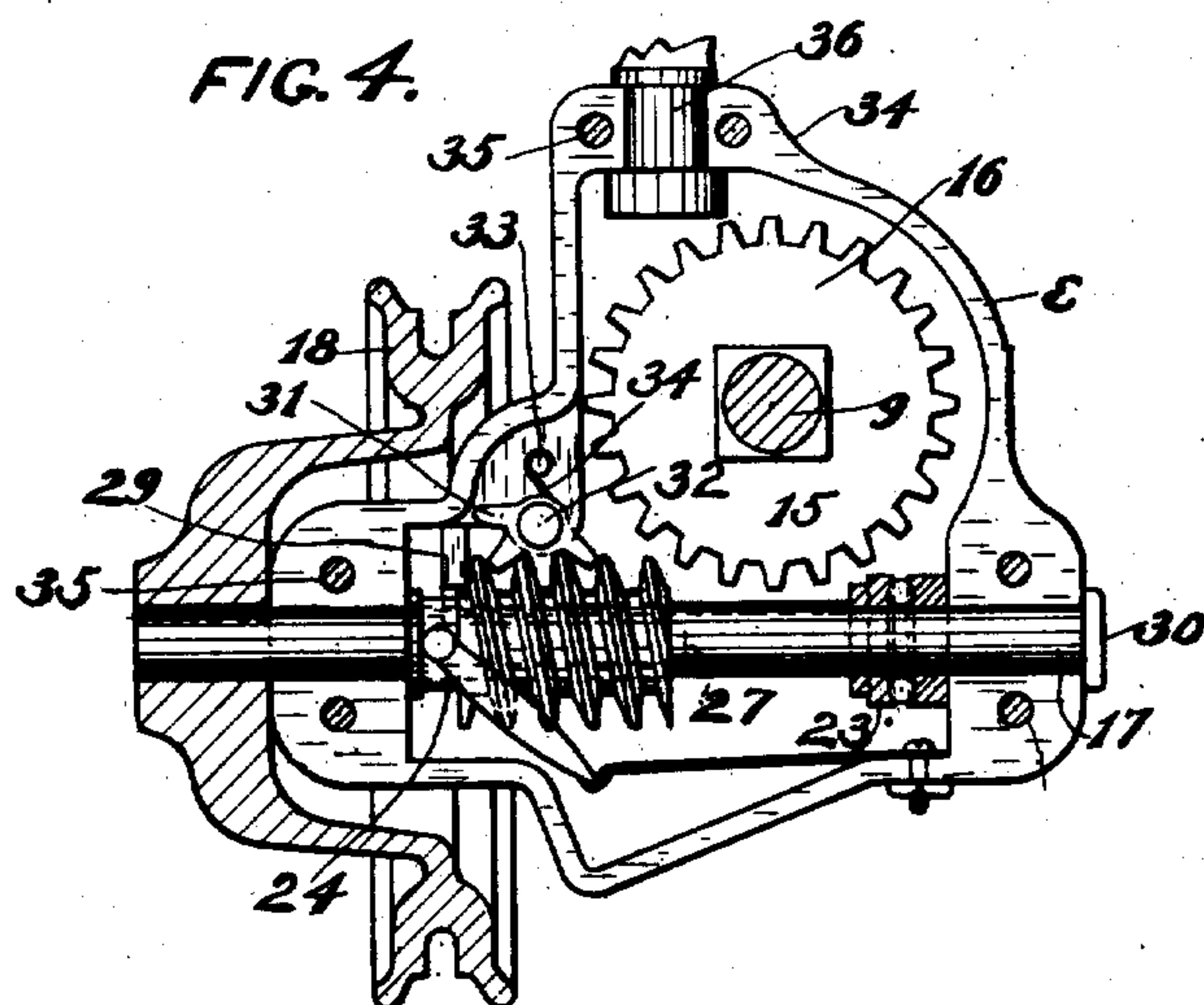
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# UNITED STATES PATENT OFFICE.

JOSEPH J. STOSICK, OF SOUTH MILWAUKEE, WISCONSIN.

## CHAIN HOIST.

No. 897,560.

Specification of Letters Patent.

Patented Sept. 1, 1908.

Application filed June 24, 1907. Serial No. 380,388.

*To all whom it may concern:*

Be it known that I, JOSEPH J. STOSICK, residing in South Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Chain Hoists, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

10 This invention relates to chain hoists and has for its object to provide a chain hoist of the screw type which may be quickly thrown out of gear to release the load chain when desired and so permit the load hook to be freely  
15 drawn down or up into position to be connected to the load to be moved, thus avoiding the slower operation of moving the unloaded load chain by means of the hand chain and wheel.

20 Another object of this invention is to provide such a chain hoist with means for automatically restoring the gearing to its operative condition by means of the hand chain when the hoisting operation is to begin.

25 A further object is to provide means for positively separating the gearing and preventing its stopping at intermediate positions between the full on and the full off positions.

30 With the above and other incidental objects in view, the invention consists of the devices and parts, or their equivalents, as hereinafter set forth.

Referring to the accompanying drawings  
35 in which like numerals of reference indicate the same parts in the several views, Figure 1 is an elevation of one side of the hoist; Fig. 2 is an end elevation thereof; Fig. 3 is a sectional view thereof, the gearing being in mesh  
40 for the hoisting operation; Fig. 4 is a similar view thereof with the gearing being out of mesh to release the load chain; Fig. 5 is a plan view thereof; and Fig. 6 is a sectional view thereof taken on line 6—6 of Fig. 1.

45 In the drawings, the numeral 8 represents the casing or frame work of the hoist formed in two sections for convenience in casting and assembling. A shaft 9 journaled in both sections of the casing 8 and projecting there-  
50 through is provided with sprocket wheels 10, 10 around each of which pass a load chain 11. The lifting ends of these chains are connected to a swivel 12 forming part of a load hook 13. The other ends of these load chains may  
55 hang freely from the sprockets, but are usually connected together. The sprocket

wheels are provided with squared openings into which fit the squared ends of the shaft 9 and the sprockets are securely held in place by means of nuts 14, 14 threaded to the ends  
60 of the shaft.

The shaft 9 within the casing is provided with a squared enlargement 15 and to this enlargement is rigidly fitted a worm wheel 16. A worm shaft 17 disposed below the  
65 shaft 9 and at right angles thereto extends through the casing at one end and has a hand wheel 18 keyed thereto and is provided with the usual hand operated chain 19 passing therearound. The worm shaft 17 is pro-  
70 vided with a sliding worm 20 slidably keyed thereto by means of a key 21 connected to said worm sliding in a keyway 22 extending almost the full length of the shaft within the casing. The shaft 17 has its bearings in the  
75 casing and to reduce the friction of the end thrust to a minimum is provided with a ball bearing 23, one cup of which is connected to the shaft and the other cup loosely surrounds the shaft and bears against the inner shoul-  
80 der of the casing forming one of the bearings for said shaft. The bearing is provided with the usual balls disposed between the two cups.

The worm 20 at one end has an angular groove 24 to accommodate the inwardly  
85 turned ends 25 of the spring-actuated forked member 26. The outwardly turned ends of the forked member ride in horizontally disposed guide ways 27 formed in both sections of the casing and are adapted to cause the  
90 ends of the forked member to move in a line parallel with the worm shaft, so that the inner ends of the forked member will always engage the groove of the worm centrally horizontally. A flat spring 28 bolted to the cas-  
95 ing is formed with a semicircular portion at its free end, and this semicircular portion engages the lower end of the forked member 26 and as the pressure of the spring is upwards there is no tendency of its moving the worm  
100 while said worm is in a position of engagement with the worm wheel, but as soon as the worm is moved out of mesh with the worm wheel, the forked member will be moved to an obtuse angle with relation to the  
105 spring and as said member is prevented from moving vertically by means of the outwardly extending ends thereof engaging the guide ways, the upward pressure of the spring will cause the upper ends of the member to slide  
110 horizontally and moving therewith the worm to the end of its sliding movement and hold-



ing the same in this position until it is again moved into mesh with the worm wheel. It will thus be seen that by this construction and arrangement, the accidental moving of the worm into mesh, or partly into mesh with the worm wheel and the possible stripping of the gear teeth is obviated.

The casing is provided with a stop which engages the end of the worm tooth to stop the further rotation of the worm when said worm has been moved to its full off position. The end of the worm shaft opposite to the hand wheel is provided with an enlargement or head 30 to prevent endwise movement.

A segmental worm wheel 31 provided with trunnions 32 journaled in both sections of the casing is positioned above the worm shaft 17 but at right angles thereto horizontally. A stop pin 33 projects outwardly from one of the sections of the casing into the path of rotation of the segmental worm wheel to limit the rotation of said worm from one end tooth to the other, and a spring 34 surrounds the trunnion upon one side of the worm and is connected thereto and the other end is connected to the stop pin 33 thereby holding the worm under spring pressure normally, in the position shown in Fig. 3.

The two sections of the casing are spaced apart by means of the angle flanges 34 which meet at the point of division of the sections to form an inclosed casing for the working parts within. The two sections of the casing are rigidly connected together by bolts and nuts 35, 35. The hoist is suspended from any desirable support by means of the swiveled supporting hook 36 disposed between the two sections of the casing. Guards 37, 37 are bolted to the casing adjacent to the chain wheels to prevent the accidental disengagement of the chains from the chain wheels.

In operation, the gears of the hoist being in mesh, as shown in Fig. 3, a load attached to the load hook will be lifted by turning the hand wheel by means of that portion of the hand chain shown in Fig. 1. The turning of the worm shaft by means of the hand chain and hand wheel will cause the worm to turn, and the worm being in mesh with the worm wheel and against one of the cups of the ball bearing, longitudinal movement is prevented, and the worm wheel will be rotated with its shaft and connected sprocket wheels and the load will be lifted by the load chains passing around the said sprockets and connected to the load hook. While the load is suspended on the load hook it may be raised or lowered by turning the hand wheel to the right or left without disengaging the gearing of the hoist, as the weight of the load tends to hold the worm against the cup of the ball bearing and in mesh with the worm wheel as shown in Fig. 3. When the load is released and it is

desired to quickly lower the load hook, to pick up another load, it is only necessary to pull on the load chain on the side of the sprocket opposite to the side from which the load hook is suspended. This movement will rotate the worm wheel in the opposite direction and move the worm longitudinally on the worm shaft. The worm in its movement will slide the upper portion of the forked member in its guide ways until the said member is at an obtuse angle with relation to the connected spring which will now tend to exert pressure longitudinally on the worm. As soon as the worm has been moved out of mesh with the worm wheel, the spring will force the worm to the end of its movement, at which position it is entirely free from the worm wheel without possible chance of its being accidentally moved into mesh with the worm wheel. If the forked member and the spring were omitted and the worm only moved by the worm wheel, the worm would be left in a position just clearing the worm wheel. The slightest vibration of the hoist caused by pulling on the chains would move the worm partly into mesh and cause damage to the gears and possible stripping of the teeth of same. The worm in moving to its inoperative position will engage the spring retrieved segmental gear and give it a partial rotation and thus provide means for restoring the coacting gears into operative positions. With the gears in the positions just described, and as shown in Fig. 4, the load chains are free to be quickly raised and lowered by a direct pull on said chains. When the load hook is again connected to the load and it is desired to raise or lower the same, the hand chain on that side of the hand wheel shown in Fig. 1 is pulled downwardly. This movement will rotate the worm and the worm will turn the segmental gear in the same direction it was moved until its further rotation is prevented by the stop pin located above said gear. The further turning of the worm will cause it to slide on the keyed worm shaft towards the ball bearing, the segmental gear serving as a stationary nut and the worm as a bolt threaded thereto. The worm will continue to slide on the worm shaft until it turns into mesh with the worm wheel, and out of mesh with the segmental gear which will be held in the position in which it is left by means of the attached spring, and the further movement of the worm is stopped by the cup of the ball bearing. A still further turning of the worm will rotate the worm wheel and lift the load as before explained.

The casing is formed in two parts bolted together for convenience in assembling, cleaning and oiling. In using the term casing, I do not wish to be understood as implying that the inclosed casing is absolutely necessary to the successful operation of the hoist, as it is obvious that the gears may be



supported in an open frame without departing from the spirit and scope of my invention.

What I claim as my invention is:

1. In a chain hoist, a casing, a worm wheel  
5 connected to said casing, a load lifting means  
connected to said worm wheel, a worm for  
moving the worm wheel, a shaft upon which  
said worm is mounted, means for rotating said  
shaft to move said worm into mesh with the  
10 worm wheel without lateral movement of the  
shaft and to operate the load lifting means,  
and means for moving the worm out of mesh  
with the worm wheel by a movement of said  
worm wheel.

2. In a chain hoist, a casing, a worm wheel  
15 connected to said casing, a load lifting means  
connected to said worm wheel, a worm for  
moving the worm wheel, a shaft upon which  
said worm is mounted, means for rotating  
20 said shaft to move said worm into mesh with  
the worm wheel by a longitudinal movement  
of the worm on said shaft and to operate the  
load lifting means, and means for moving the  
worm out of mesh with the worm wheel by a  
25 movement of said worm wheel.

3. In a chain hoist, a casing, a worm wheel  
connected to said casing, a load lifting means  
connected to said worm wheel, a worm for  
moving the worm wheel, a shaft upon which  
30 said worm is mounted, keyed connections  
between said worm and shaft, means for ro-  
tating said shaft to move said worm into  
mesh with the worm wheel without lateral  
movement of the shaft and to operate the  
35 load lifting means, and means for moving the  
worm out of mesh with the worm wheel by a  
movement of said worm wheel.

4. In a chain hoist, a casing, a worm wheel  
connected to said casing, a load lifting  
40 means connected to said worm wheel, a worm  
for moving the worm wheel, a shaft upon  
which said worm is mounted, means for ro-  
tating said shaft to move said worm into  
mesh with the worm wheel without lateral  
15 movement of the shaft, means for moving  
the worm out of mesh with the worm wheel  
by a movement of said worm wheel, and  
other means for giving the worm a further  
movement.

5. In a chain hoist, a casing, a worm wheel  
connected to said casing, a load lifting means  
connected to said worm wheel, a worm for  
moving the worm wheel, a shaft upon which  
said worm is mounted, keyed connections be-  
5 tween the worm and the shaft, means for ro-  
tating said shaft to move said worm into  
mesh with the worm wheel by a longitudinal  
movement of the worm on said shaft, means  
for moving the worm out of mesh with the  
0 worm wheel by a movement of said worm  
wheel, and spring actuated means for giving  
the worm a further longitudinal movement.

6. In a chain hoist, a casing, a worm wheel  
journaled in said casing, a chain sprocket  
5 connected to the worm wheel, a load chain

mounted on said sprocket, a worm for mov-  
ing the worm wheel, a shaft upon which said  
worm is slidably mounted, keyed connec-  
tions between the worm and the shaft, means  
for rotating said shaft to move said worm 70  
into mesh with the worm wheel, and means  
for moving the worm out of mesh with the  
worm wheel by a movement of said worm  
wheel.

7. In a chain hoist, a casing, a worm wheel 75  
journaled in said casing, a chain sprocket  
connected to the worm wheel, a load chain  
mounted on said sprocket, a worm for mov-  
ing the worm wheel, a shaft upon which said  
worm is slidably mounted, keyed connec- 80  
tions between the worm and the shaft, means  
for rotating said shaft to move said worm  
into mesh with the worm wheel, means for  
moving the worm out of mesh with the worm  
wheel by a movement of said worm wheel, 85  
and spring-actuated means for giving the  
worm a further movement.

8. In a chain hoist, a casing, a shaft jour-  
naled in said casing and extending there-  
through, a worm wheel mounted on said 90  
shaft, chain sprockets mounted on the outer  
ends of said shaft, a worm for moving the  
worm wheel, a shaft upon which said worm  
is slidably mounted, keyed connections be-  
tween the worm and the shaft, a hand wheel 95  
for rotating said shaft to move said worm  
into mesh with the worm wheel, means for  
moving the worm out of mesh with the worm  
wheel by a movement of said worm wheel, and  
spring-actuated means for giving the worm 100  
a further movement on the shaft.

9. In a chain hoist, a casing, a shaft jour-  
naled in said casing and extending there-  
through, a worm wheel mounted on said 105  
shaft, chain sprockets mounted on the outer  
ends of said shaft, a worm for moving the  
worm wheel, a shaft upon which said worm  
is slidably mounted, keyed connections be-  
tween the worm and the shaft, a hand oper-  
ated chain wheel mounted on said shaft and 110  
adapted to rotate the same to move said  
worm into mesh with the worm wheel, means  
for moving the worm out of mesh with the  
worm wheel by a movement of said worm  
wheel, a spring actuated member adapted to 115  
give the worm a further movement on the  
shaft, and an engaging means adapted to  
engage the worm when said worm is out of  
mesh with the worm wheel.

10. In a chain hoist, a casing, a shaft jour- 120  
naled in said casing and extending there-  
through, a worm wheel mounted on said  
shaft, chain sprockets mounted on the outer  
ends of said shaft, a worm for moving the  
worm wheel, a shaft upon which said worm 125  
is slidably mounted, keyed connections be-  
tween the worm and the shaft, a hand oper-  
ated chain wheel mounted on said shaft and  
adapted to rotate the same to move said  
worm into mesh with the worm wheel, a seg- 130



mental gear positioned to engage the worm when said worm is out of mesh with the worm wheel and adapted to move the worm into mesh when the worm is rotated, means for  
 5 moving the worm out of mesh with the worm wheel by a movement of said worm wheel, and a spring-actuated member adapted to give the worm a further movement on the shaft.

11. In a chain hoist, a casing, a shaft jour-  
 10 naled in said casing and extending there- through, a worm wheel mounted on said shaft, chain sprockets mounted on the outer ends of said shaft, a worm for moving the worm wheel, a shaft upon which said worm  
 15 is slidably mounted, keyed connections between the worm and the shaft, a hand operated chain wheel mounted on said shaft and adapted to rotate the same to move said worm into mesh with the worm wheel, a seg-  
 20 mental gear positioned to engage the worm when said worm is out of mesh with the worm wheel and adapted to move the worm into mesh when the worm is rotated, a stop for limiting the movement of the gear, means  
 25 for moving the worm out of mesh with the worm wheel by a movement of said worm wheel, and a spring-actuated member adapted to give the worm a further movement on the shaft.

30 12. In a chain hoist, an inclosed casing, a

shaft journaled in said casing and extending therethrough, a worm wheel mounted on said shaft, chain sprockets mounted on the outer ends of said shaft, a chain provided with a hook mounted on said sprockets, a worm for  
 35 moving the worm wheel, a shaft upon which said worm is slidably mounted, keyed connections between the worm and the shaft, a hand operated chain wheel mounted on said shaft and adapted to rotate the same to  
 40 move said worm into mesh with the worm wheel, a spring returned segmental gear positioned to engage the worm when said worm is out of mesh with the worm wheel and adapted to move the worm into mesh when  
 45 the worm is rotated, a stop for limiting the movement of the gear, means for moving the worm out of mesh with the worm wheel by a reverse movement of said wheel, a spring-actuated member adapted to give the worm  
 50 a further movement on the shaft, and guide ways in the casing for guiding the upper ends of the spring-actuated member.

In testimony whereof, I affix my signature, in presence of two witnesses.

JOSEPH J. STOSICK.

Witnesses:

ANNA F. SCHMIDTBAUER,  
 C. H. KEEVER.